Precalc Warm Up #6-3

$f(x) = 10x - 5$, $x \geq 4$ Find $f^{-1}(x)$

HW Questions:

EXERCISES 5.4.2

1. Find the inverse function for each of the following.

(a) $f(x) = 2x + 1, x \in \mathbb{R}$

(c) $g(x) = \frac{1}{3}x - 3, x \in \mathbb{R}$

(e) $h(x) = \sqrt{x+1}, x > -1$

(g) $f(x) = \frac{1}{x+1}, x > -1$

$(y+1)\frac{x}{1} = \frac{1}{y+1}(y+1)$

$\frac{(y+1)x}{x} = \frac{1}{x}$

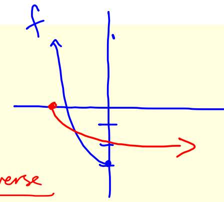
$y + 1 - 1 = \frac{1}{x} - 1$

$y = \frac{1}{x} - 1$

3. Find and sketch the inverse function of

(a) $f(x) = x^2 - 3, x \geq 0$. (b) $f(x) = x^2 - 3, x \leq 0$.

$y \geq -3$



Inverse

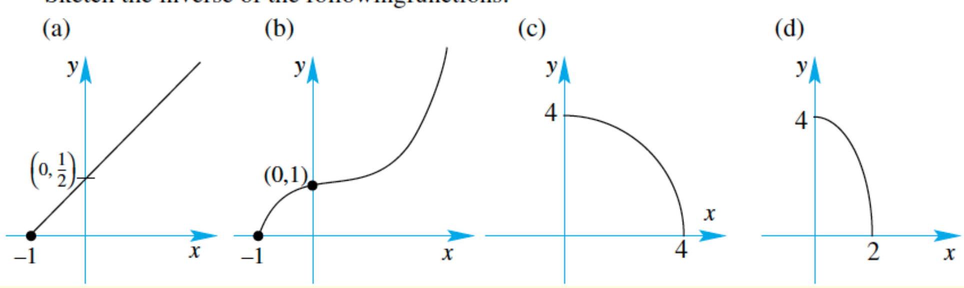
$x = y^2 - 3$

$x + 3 = y^2$

$y = \pm\sqrt{x+3}$

$f^{-1}(x) = -\sqrt{x+3}$ $r_{f^{-1}} = (-\infty, 0]$

5. Sketch the inverse of the followingfunctions:



9. Find the inverse function of $f(x) = x^2 + 2x, x \geq -1$, stating both its domain and range. Sketch the graph of f^{-1}.

$0 = x(x+2)$ vertex $(-1,-1)$

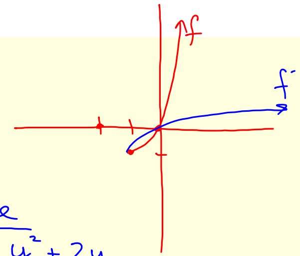
$r_f = [-1, \infty)$

$d_f = [-1, \infty)$

$r_f = [-1, \infty)$

$d_{f^{-1}} = [-1, \infty)$

$r_{f^{-1}} = [-1, \infty)$



Inverse

$x = y^2 + 2y$

$x = y^2 + 2y + 1 - 1$

$x = (y+1)^2 - 1$

$\pm\sqrt{x+1} = \sqrt{(y+1)^2}$

$y + 1 = \pm\sqrt{x+1}$

$y = -1 \pm \sqrt{x+1}$

$\boxed{f^{-1}(x) = -1 + \sqrt{x+1}}$

10. Find the inverse function of (a) $f(x) = -x + a, x \in]-\infty, \infty[$, where a is real.

(b) $h(x) = \dfrac{2}{x-a} + a, x > a$, where a is real.

(c) $f(x) = \sqrt{a^2 - x^2}, 0 \leq x \leq a$, where a is real.

$x = \sqrt{a^2 - y^2}$

$x^2 = a^2 - y^2$

$\sqrt{y^2} = \sqrt{a^2 - x^2}$

$y = \pm\sqrt{a^2 - x^2}$

which?

range +

$f^{-1}(x) = \sqrt{a^2 - x^2}$

11. Find the inverse of $h(x) = -x^3 + 2, x \in \mathbb{R}$. Sketch both $h(x)$ and $h^{-1}(x)$ on the same set of axes.

12. Find the largest possible set of positive real numbers **S**, that will enable the inverse function h^{-1} to exist, given that $h(x) = (x-2)^2, x \in \mathbf{S}$.

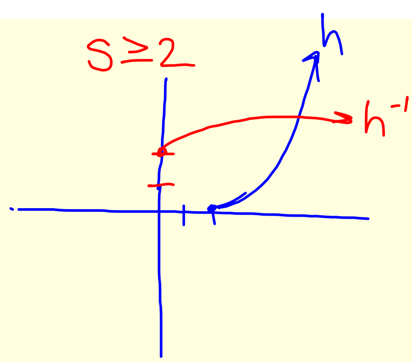
$$x = (y-2)^2$$

$$\pm\sqrt{x} = y - 2$$

$$y = 2 \pm \sqrt{x}$$

$$h^{-1}(x) = 2 + \sqrt{x}$$

$S \geq 2$



Group Event

* You can only write on your own paper

* Work together and make sure everyone agrees on what each person is writing on their paper. Check details!

* One paper will be selected at random for grading.

HW: PC Book

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skip 11 and 45ac